1. SUSTAINABLE DESIGN

A. Background

On February 22nd, 2000 the Seattle City Council unanimously endorsed the **Sustainable Building Policy** which is part of the City's Environmental Management Program. The Office of Environmental Management guides City operations toward environmental stewardship by coordinating implementation of Seattle's Environmental Management Program (EMP). The mission of the EMP is to foster the City's compliance with environmental laws, to assist departments to reduce environmental impacts from operations, and to improve environmental performance. Areas of City operations that most impact the environment have been identified, from landscape management to use of chemicals to fleet fuel use. Policies to improve the City's environmental performance in each of those areas have been developed for inclusion in the EMP. The Green Building Team,[1] an interdepartmental committee of technical, policy and program staff was formed to develop the sustainable building policy and to plan for its implementation.

B. Why A City Policy?

The purpose of a Citywide policy on sustainable building is to demonstrate the City's commitment to environmental, economic, and social stewardship, to yield cost savings to the City taxpayers through reduced operating costs, to provide healthy work environments for staff and visitors, and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, the City helps to set a community standard of sustainable building.

C. What Is Sustainable Building?

Sustainable building integrates building materials, systems and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. Sustainable building merges sound, environmentally responsible practices into one discipline that looks at the environmental, economic and social effects of a building or built project as a whole. The entire life-cycle of the built environment is included (planning, design, construction, operation and maintenance, and demolition or disassembly). Sustainable building design encompasses the following broad topics: efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, reinforcement of natural systems, and integrating the design approach.

Sustainability is "Meeting the needs of the present without compromising the ability of future generations to meet their own needs." The concept of sustainable building is derived from this broader definition of sustainability. Sustainability seeks to balance concerns for continuing growth and human development with concern for the well-being of the planet. Concepts of sustainability and sustainable building must expand to include community and social issues, spiritual beliefs, restorative acts versus just maintaining survival, and hope for an abundant future. "In its original context, this (*sustainability*) definition was stated solely from the human point of view. In order to embrace the idea of a global ecology with intrinsic value, the meaning must be expanded to allow all parts of nature to meet their own needs now and in the future…. Sustainable design is the conception and realization of ecologically, economically and

[1] The Green Building Team includes representatives from the Office of Environmental Management, City Light, DCLU, Seattle Public Utilities, Parks, Executive Services and the Seattle Lighting Design Lab.

ethically responsible expression as part of the evolving matrix of nature"[2]

D. Why Is Sustainable Building Important?

The building industry is the nation's largest manufacturing activity, representing 13% of Gross Domestic Product. In addition, buildings represent more than 50% of the nation's wealth. The design, construction and maintenance of buildings has a tremendous impact on people and nature. Structures also impact areas beyond their immediate location, affecting the watersheds, air quality, and transportation patterns of communities. Buildings consume or are responsible for:

- 40 % of the world's total energy use
- 25 % of timber harvest
- 16 % of fresh water withdrawal
- 50% of ozone-depleting CFCs still in use
- 30% of raw materials consumption
- 35% of the world's CO_2 emissions
- 40% of municipal solid waste destined for local landfills

E. Benefits Of Sustainable Building

1. Reduce operating costs.

a. Energy Efficiency

- Climate-sensitive design and energy technology use can cut heating and cooling energy consumption by 60 percent and lighting energy requirements by 50% in U.S. buildings.
- Returns on investment for energy-efficiency measures can be higher than rates of return on conventional and even high-yielding investments.
- Widespread participation in the U.S. EPA's Green Lights program could save over 65 million kilowatts of electricity, and reduce the nation's electric bill by $16 billion annually.

b. Water Efficiency

- Water-efficient appliances and fixtures, behavioral changes, and changes in irrigation methods can reduce consumption by up to 30% or more.
- A typical 100,000 square foot office building can yield annual savings of $4,393 by installing high efficiency measures and reducing water consumption by 30%.

C. Waste Reduction

- Construction and demolition waste equals from 35% to 40% of Municipal Solid Waste.
- Construction and demolition waste recycling can result in significant savings of not only landfill space but waste hauling and tipping fees. The Portland Trailblazers Rose Garden arena construction/demolition project saved an estimated $186,000 through waste diversion and recycling.
- Recycling creates jobs. Diverting these materials to local processors instead of local landfills creates new economic opportunities.[3]

2. Reduce some first costs.

- Rehabilitating an existing building can lower infrastructure and materials costs.
- Integrated design can use the payback from some strategies to pay for others.
- Energy efficient buildings can reduce their equipment needs -- downsizing some equipment, such as chillers, or eliminating equipment, such as perimeter heating.
- Using pervious paving and other runoff prevention strategies can reduce the size and

[2] William McDonough, The Hannover Principles: Design for Sustainability.
[3] Institute for Local Self Reliance

cost of stormwater management structures.

3. Expand timeframe to create return on investment.

Life Cycle Cost Analysis looks at the net present value of design options as investments. The goal is to achieve the highest, most cost-effective environmental performance possible over the life of the project. Within a building's total life span, initial building costs account for approximately 2% of total life cycle costs, while operations and maintenance costs account for 6%, and *personnel costs account for 92%.*

Many green building measures make good long-term economic sense if the first cost is subtracted from all future savings, and savings are calculated with market capitalization rates. In other words, many green building measures can be thought of as investments which will gain value over time, over and above investments at market interest rates.

Low up-front expenditures can often result in much higher costs over the life of a building.

4. Help protect endangered salmon.

The Governor's draft Salmon Recovery Plan spells out seven specific areas of human activity that threaten salmon. Four of these areas - *land use decisions, storm water management, water use*, and *water pollution* are directly impacted by building and development. Sustainable building techniques that address these and other areas include:

- Preserve existing vegetation and cluster development to preserve streamside habitat.
- Minimize impervious surfaces to decrease flooding and protect base stream flows.
- Install water efficient building systems to protect area water supplies and habitat areas.
- Use low toxic building materials that reduce water pollution during manufacturing and installation.
- Minimize energy consumption and provide renewable on-site power generation in order to reduce demand for hydropower.
- Use sustainably certified lumber from the Pacific Northwest region.

5. Improve Productivity and Human Health.

- Improved indoor environments[4] can increase employee productivity by up to 16%
- Employees in buildings with healthy interiors have less absenteeism and tend to stay in their jobs
- The US Environmental Protection Agency ranks indoor air pollution among the top five environmental risks to public health. One third of all buildings have poor indoor air quality.
- Sick Building Syndrome and Building Related Illness are estimated to cost $60 billion per year in medical expenses and lost worker productivity in the U.S.
- Benefits to tenants of green buildings with good overall environmental quality include reduced absenteeism and better employee morale, and community recognition.
- Ensuring healthy indoor air can reduce insurance and operating costs and reduce liability risks. The U.S. EPA faced a lawsuit from employees who became ill after new carpet was installed during a renovation. The employees won the lawsuit, worth approximately $1 million.

6. Provide Community Benefits.

Sustainable building can help to support and or protect:

[4] Good indoor overall environmental quality includes effective ventilation, natural or proper levels of lighting, good indoor air quality and acoustics.

- The local economy through demand for local building materials, jobs and industries
- Area environmental quality such as clean air and water
- Longevity of public infrastructure, such as power plants, landfills, and water treatment plants
- Social equity through the inclusion of community groups and special populations in design process
- Global climate change mitigation by lowering energy and material consumption in building construction and operation, which can contribute to climate change.

F. Why The LEED ä Rating System?

The City of Seattle Sustainable Building policy is tied to a green building rating system, known as LEED™, which was developed by the US Green Building Council (USGBC). The USGBC was formed in 1993 to "accelerate the adoption of green building practices, technologies, policies, and standards." Their philosophy is that resources required for creating, operating, and replenishing the current level of infrastructure are enormous, yet resources available for such activity are diminishing; to remain competitive and to continue to expand and produce profits in the future, the building industry must address the economic and environmental consequences of its actions. Council membership consists of more than 275 organizations including: product manufacturers; environmental leaders such as the Natural Resources Defense Council and the Audubon Society; building and design professionals such as the American Institute of Architects; and retailers and building owners. The City of Seattle joined the USGBC in 1999.

The USGBC developed the Leadership in Energy and Environmental Design(LEED)™ rating system to achieve market transformation. LEED™ is a self-certifying system designed for rating new and existing commercial, institutional, and high-rise residential buildings. Different levels of green building certification are awarded based on the total credits earned in each of several categories: site, energy, material resources, indoor environmental quality and water. The system is designed to be comprehensive in scope, yet simple in operation. Use of a national standard helps to establish minimum performance standards, creates a common dialogue for discussion, and allows Seattle to measure its sustainable building performance related to other jurisdictions that are using LEED™. In addition, technical rulings, training, networking and marketing support are provided by the USGBC. In 2000, a regional chapter of the USGBC, the Cascadia Chapter, was formed. The regional chapter includes Washington, Idaho, Montana, and Oregon. Chapter members support the activities of the USGBC and the implementation of LEED™ as a market transformation tool.

1. The Seattle policy states:

It shall be the policy of the City of Seattle to finance, plan, design, construct, manage, renovate, maintain, and decommission its facilities and buildings to be sustainable. This applies to new construction and major remodels in which the total project square footage meets the criteria given. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system and accompanying Reference Guide shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards. All facilities and buildings over 5,000 gross square feet of occupied space shall meet a minimum LEED Silver rating.

2. Desired performance:

While the Silver LEED™ rating is the stated target, it should be noted that this is a minimum. Project managers and design teams are encouraged to go above the Silver

level. The project target of occupied space was chosen in order to focus on projects in which the human benefits of building sustainably could be realized. In addition, the LEED™ rating system was developed for application to commercial, institutional, and high rise residential projects. The City of Seattle constructs many projects that do not meet the given criteria. These projects may include buildings or remodels smaller than 5000 square feet, buildings that are not occupied, or facilities such as parks, roadways, and other infrastructure. Project managers and design teams are encouraged to apply the portions of the LEED™ rating system which make sense for their project, and to seek out other project goals that increase the environmental, social, and economic benefits of the project.

G. LEED™ Rating System Seattle Supplements

The Project Manager will provide consultants an electronic version of the LEED™ Ratings System and the Seattle Supplements to LEED™ .The purpose of the Seattle Supplements to LEED™ is to provide integration of the LEED™ system with local building codes, practices, and City policies. In addition, resource information is provided to connect City capital project managers with program staff and information. The Seattle Supplements will be updated as additional resources are identified. Please feel free to provide feedback or suggestions regarding changes or additions to the Supplements. These and other Green Building information will be available on the Web at: http://cityofseattle.net/util/RESCONS/susbuild

There a few minor modifications to the LEED™ system which are required for use with City projects. These are noted in the Supplements. The additional requirements are:

- All projects shall comply with the **City Landscape and Grounds Management Guidelines**.
- All projects shall achieve a minimum of two credits in the Energy section from Energy Credit 1

In addition, there are several other city policies and programs that relate to sustainable building, and these have been included for your reference. These are:

- The City's resolution regarding use of sustainably certified wood,
- The City's policy regarding purchasing of recycled content materials, and
- The Copernicus Project, the City's plan to redesign the way goods and services are procured.

2. SUSTAINABLE BUILDING POLICY AND PROCEDURES (Includes Design, Construction, and Operations)

A. Purpose

The purpose of a Citywide policy on sustainable building is to demonstrate the City's commitment to environmental, economic, and social stewardship, to yield cost savings to the City taxpayer's through reduced operating costs, to provide healthy work environments for staff and visitors, and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, as a leader the City helps to set a community standard of sustainable building.

B. Organizations Affected

All City departments and offices and their contractors responsible for financing, planning, designing, developing, constructing and managing city-owned facilities and buildings.

C. Definitions

1. Sustainable Building

Sustainable building integrates building materials and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. Sustainable building merges sound, environmentally responsible practices into one discipline that looks at the environmental, economic and social effects of a building or built project as a whole. Sustainable design encompasses the following broad topics: efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, reinforcement of natural systems, and integrating the design approach.

2. Life Cycle Cost Analysis

An inclusive approach to costing a program, facility, or group of facilities that encompasses planning, design, construction, operation and maintenance over the useful life of the facilities and finally any decommissioning or disassembly costs. Life Cycle Cost Analysis looks at the net present value of design options as investments. The goal is to achieve the highest, cost –effective environmental performance possible over the life of the building.

3. LEED Rating System

LEED stands for Leadership in Energy and Environmental Design, and is a voluntary, consensus-based, market-driven green building rating system. It is based on existing, proven technology and evaluates environmental performance from a "whole building" perspective. LEED is a self-certifying system designed for rating new and existing commercial, institutional, and multi-family residential buildings. It contains prerequisites and credits in five categories: Sustainable Site Planning, Improving Energy Efficiency, Conserving Materials and Resources, Embracing Indoor Environmental Quality, and Safeguarding Water. There are four rating levels: Bronze, Silver, Gold, and Platinum.

C. Policy

It shall be the policy of the City of Seattle to finance, plan, design, construct, manage, renovate, maintain, and decommission its facilities and buildings to be sustainable. This applies to new construction and major remodels in which the total project square footage meets the criteria given. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system and accompanying Reference Guide shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards. **All facilities and buildings over 5,000 gross square feet of conditioned space as defined by the Seattle Energy Code,** shall meet at minimum LEED Silver rating. The Office of Environmental Management shall establish the minimum number of credits required in each of the LEED categories so that projects shall show demonstrate performance in all categories.

Design and project management teams are encouraged to meet higher LEED rating levels. A Mayor's Award for achieving a higher rating will be awarded. *(See also Energy and Water Conservation Policy and Landscape and Grounds Management Policy.)*

D. Procedures and Responsibilities

The Directors of all City Departments shall be responsible for ensuring that facilities and buildings shall comply with the City's Environmental Management Plan, Section 6.9.4.

The City's Office of Environmental Management (OEM) shall be responsible for coordinating any educational, technical and financial resources available to City departments that support and promote sustainable design and construction of city facilities. The City's OEM shall be responsible for annually evaluating and reporting to the Oversight Panel how well applicable City construction projects meet the goal of sustainability.

The City's Green Building Team, under the OEM, shall be responsible for reviewing and updating the City portion of the LEED reference manual annually, for providing technical expertise on specific sustainable building issues on a case by case basis, and coordinating LEED training programs.

E. Budgeting and Financing

All capital construction, which falls under this policy, will be expected to budget to meet at minimum the LEED Silver rating. Budget planning and life cycle cost analysis to achieve a higher rating of gold or platinum is encouraged.

F. Training

City capital project managers currently managing or likely to manage projects which fit the criteria in City's Environmental Management Plan, Section 6.9.4., will be responsible to attend introductory LEED training and annual follow-up training. LEED training will be offered through the Office of Environmental Management.

G. References

City of Seattle Sustainable Building Action Plan
Seattle's Solid Waste Plan: On the Path to Sustainability
USGBC LEED Reference Manual
Seattle Supplements to the LEED Reference manual

3. SUSTAINABLE WOOD AND WOOD PRODUCTS POLICY

Seattle City Council Resolution 30015, unanimously endorsed by City Council and adopted September 7, 1999, relating to the purchase of sustainably certified wood and wood products by the City of Seattle. The Resolution reads as follows:

A RESOLUTION directing the Executive Services Department to investigate the feasibility of increasing the percentage of the City of Seattle's purchases of wood and wood products from businesses certified as practicing sustainable forestry.

WHEREAS, Resolution 29885 endorsed the City of Seattle's Environmental Management Program which includes a policy stating that the City shall promote the use of environmentally preferable products in its acquisition of goods and services; and

WHEREAS, the Environmental Management Program policy on Environmentally Preferable Purchasing states that the City shall seek opportunities to enhance markets for environmentally preferable products through a number of approaches including testing new products and adopting innovative product standards, specifications, and contracts; and
s
WHEREAS, while the percentage of recycled content of paper purchased by the City has and will continue to increase, the majority of the paper pulp used to manufacture the paper originates from virgin timber; and

WHEREAS, unsustainable forest management can cause soil erosion and loss of biodiversity and can negatively affect the economic future of many communities; and

WHEREAS, timber production, when managed effectively, maintains the long-term viability of commercial forests, protects biodiversity and provides a continuous stream of social and economic benefits; and

WHEREAS, of the 500 million acres of commercial timberland in the United States, only 2.2 million acres are certified to be harvested in such a way that the area is left as a sustainable resource; and

WHEREAS, increasing the market demand for products from forests that are certified as managing and harvesting timber in an ecologically sound manner will provide an incentive for commercial timberland operators to certify more of their acreage as practicing sustainable forestry management and harvest; and

WHEREAS, the City of Seattle purchases a substantial amount of wood
and pulp products including paper and cedar poles for utility lines;
Now therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR CONCURRING, THAT:

Section The City Council encourages the Executive Services Department (ESD) in its efforts to implement the City's policy on Environmentally Responsible Purchasing, and appreciates ESD's initiative in researching options and developing strategies for increasing the percentage of City purchases of paper and other wood products that originate from businesses certified as practicing sustainable forestry.

Section The Executive Services Director shall report back to the City Council with a status report and recommendations on strategies for implementing the intent of this resolution no later than December 31, 1999.

August 25, 1999

End of Appendix 1 - G